

Ref IRSN: LS 11309

**AGREEMENT RELATING TO PARTICIPATION OF NRC TO THE CCI-7 TASK OF THE EDF  
PROGRAM CALLED EXPERIMENTS TO DEMONSTRATE EX-VESSEL CORE COOLABILITY  
UNDER EARLY CAVITY FLOODING CONDITIONS"**

**BETWEEN**

**INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE**, a French State-owned and operated public body with a commercial and industrial vocation, created by article 5 of the law n°2001-398 dated 9th May 2001 and by decree n°2002-254 dated 22nd February 2002, whose registered office is at 31, avenue de la Division Leclerc, 92260 Fontenay-aux-Roses, France, and identified under n° RCS Nanterre B440 546 018;

represented by **Mr. Jacques REPUSSARD**, its General Director;

hereinafter referred to as "IRSN",

**ON THE ONE HAND,**

**AND**

**THE UNITED STATES NUCLEAR REGULATORY COMMISSION [HEREUNDER US NRC]**, having its headquarters located in Rockville, Maryland, 20852, USA,

represented by **Dr. Brian W. SHERON**, in his capacity as Director, Office of Nuclear Regulatory Research,

**ON THE OTHER HAND,**

hereinafter referred to collectively as "Parties" and individually as "Party".

## **PREAMBLE**

The complementary experimental program "EXPERIMENTS TO DEMONSTRATE EX-VESSEL CORE COOLABILITY UNDER EARLY CAVITY FLOODING CONDITIONS" comes within the scope of the continuity of the Melt Coolability and Concrete Interaction OECD project (MCCI-OECD) dedicated to the study of the corium concrete interaction and the cooling mechanisms making it possible to stop the progression of corium. This program was initiated in 2002 by United States Nuclear Regulatory Commission (NRC) and was organized in two OECD projects on the Argonne National Laboratory (ANL) facilities whose teams are still the only one in the world able to implement masses of prototypic corium reaching the ton. The second project was completed in 2010 by the realization of an integral test which opened interesting prospects for containment failure risk mitigation by early cavity top flooding.

In the context of long term operation of the French nuclear capacity, the study of means making it possible to avoid the loss of containment integrity is an important item for EDF and IRSN. Cooling by water addition at upper surface is one of the mitigation means applicable to the existing plants but it could also constitute an interesting alternative if its effectiveness is demonstrated to simplify the design of the GEN III reactors.

Beyond the prospects open at the end of MCCI-OECD project, complementary integral tests are necessary to bring conclusive elements about the effectiveness of this mode of cooling at reactor scale. EDF thus set up this new program in order to carry out complementary tests. This program coordinated and financed by EDF will be carried out technically by ANL (hereafter the "PROGRAM"). Detailed description of the PROGRAM is provided in appendix 2.

EDF proposed to IRSN and NRC to join the financing and take part to the definition, the follow-up of realization, the interpretation of the CCI-7 test and the realization of a benchmark exercise between simulation tools (hereafter the "PROJECT").

IRSN and NRC received the PROJECT favourably and wish to collaborate with EDF in its realization. IRSN defined with EDF its participation in a bilateral contract including appropriate rights to extend the participation to NRC.

The Parties thus met in order to define the conditions under which NRC and IRSN are committed collaborating for the realization of the PROJECT and were appropriate of what follows.

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Article 1. **DEFINITIONS**

As used in this Agreement, the terms below shall have the following meanings:

- a. **"Agreement"** means the present document consisting of Articles 1 to 14 and its appendix. In case of discrepancy between this document and its appendix, this document shall prevail over its appendix.
- b. **"Background"** means information which is held by the Parties prior to their accession to this Agreement, as well as copyrights or other intellectual property rights pertaining to such information, and which is needed for carrying out the Project or for using the Results;
- c. **"Confidential Information"** means all information or knowledge in whatever form or mode of transmission, protected or not by an intellectual property rights and which is disclosed by a the Disclosing Party(ies) to the Recipient in connection with the Project during its implementation. It is understood between the Parties that Background and Results are Confidential Information.
- d. **"Deliverables"** means altogether:
  - i. The deliverables of the task 1 to be provided by EDF to IRSN and transmitted to NRC during the PROGRAM and defined in article 4 and Appendix 1.
  - ii. The deliverable of the task 2 to be provided by NRC to IRSN and via IRSN to EDF, the deliverable of the task 2 to be provided by IRSN to NRC and EDF and the deliverable of the task 2 to be provided by EDF to IRSN and NRC via IRSN.
- e. **"Results"** means the results from the PROJECT whatever its forms and nature protected or not by an intellectual property right and formalized by the Deliverables.
- f. **"PROGRAM Leader"** means Electricité De France-EDF established under registration 552 081 317 R.C.S. PARIS; and whose registered offices is at 22-30 AV DE WAGRAM 75008 PARIS, FRANCE.

Article 2. **PURPOSE**

The purpose of this Agreement is to define the terms and conditions of performance of the PROJECT and notably conditions under which:

- NRC shall fund the PROJECT
- NRC shall perform a part of the PROJECT
- IRSN shall grant to NRC an access rights over the PROGRAM Leader's Results and it's Results
- NRC shall grant to IRSN an access rights to its Results with the right to sub-licence these rights to the PROGRAM Leader.

This Agreement is concluded with no reference to other pre-existing contracts or future contracts subject to article 10.

The PROJECT consists of the 2 tasks as specified in Appendix 1.

**Article 3. TECHNICAL CORRESPONDENTS**

- a. In order to ensure that the PROJECT is performed properly, each Party designates one technical correspondent, as mentioned below (hereinafter referred to collectively as "Technical Correspondents").  
The Technical Correspondents shall meet at least once a year and as necessary, alternatively in France and in USA.
- b. The Parties appoint the following Technical Correspondents:
  - For IRSN:  
Jean-Michel BONNET  
IRSN/DPAM/SEMIC  
Centre de Cadarache, Bât 702  
BP 3 - 13115 ST PAUL LEZ DURANCE CEDEX
  - For NRC:  
Richard Lee  
Branch Chief, Fuel and Source Term Code Development Branch,  
Office of Nuclear Regulatory Research  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Each Party may change its Technical Correspondents during the PROJECT, by giving one month's prior written notice to the other Party.

**Article 4. DELIVERABLES**

- a. Details of tasks are provided in Appendix 1. The definition, monitoring of implementation and interpretation of test CCI-7 consist of task 1 as described in Appendix 1 and the participation in a benchmark exercise between simulation tools organized by ANL consists of task 2. Technical context of the PROGRAM to be performed by ANL are described in Appendix 2 in answer to the joint request of the Parties and the PROGRAM Leader.
- b. Under this Agreement, IRSN shall deliver to the Technical Correspondent of NRC the following Deliverables at these indicative dates, as described in Appendix 1 for execution of task 1 and 2 by the PROGRAM Leader.

Deliverable N°	Year	Date	Deliverable transmitted by EDF within the project
Milestone	2012	T0 : project kick-off, 1 <sup>st</sup> of January 2012	

1	2012	T0+3 months	CCI-7 pretest design report
<i>Milestone</i>	2012	<i>T0+6 months test conduction</i>	
2	2012	T0 + 7 month	Benchmark exercise specification report
<i>Milestone</i>	2012	<i>T0 + 10 months results form simulation transmitted to ANL</i>	<i>Calculation reports</i>
3a			EDF calculation report
4	2012	T0 + 10 months	CCI-7 test report
5	2012	T0 + 12 months	Final report including ANL synthesis of benchmark exercise
<i>Milestone</i>	2012	<i>T0 + 12 months end of the project after final report approval</i>	

c. NRC shall deliver to IRSN for execution of task 2 the following deliverable:

<i>Deliverable N°</i>	<i>Year</i>	<i>Date</i>	<i>Deliverable transmitted by NRC within the project</i>
3c	2012	<i>T0 + 10 months results form simulation transmitted to ANL</i>	NRC calculation report

d. IRSN shall deliver to NRC for execution of task 2 the following deliverable:

<i>Deliverable N°</i>	<i>Year</i>	<i>Date</i>	<i>Deliverable transmitted by IRSN within the project</i>
3b	2012	<i>T0 + 10 months results form simulation transmitted to ANL</i>	IRSN calculation report

- e. In case of delay for delivering the deliverable of task 1 and 2, due to EDF, IRSN will inform the Technical Correspondent of NRC immediately. Any delay due to EDF shall not be assumed by IRSN. No liability shall be assumed by IRSN in this case. NRC in this case shall request of the PROGRAM Leader to be compensated for any harm suffered due to the delay.
- f. After the submission of the specifications report of the benchmark, blind calculations of the test will be executed by EDF, IRSN and NRC with their own tools within a maximum of 3 months. These blind calculations will be reported in 3 deliverables, one for each tool as specified in Appendix 1.  
NRC will send to IRSN in the aforementioned delay its report; IRSN will send its report to NRC with the PRROGRAM Leader's report. Each Party and the Program leader shall use all reasonable means to send each report in time.

**Article 5. ACCESS RIGHT**

- a. **Background**  
Each Party remains the owner of its own Background.  
No rights over a Party's Background are given to the other Party under the Agreement. In case of transmission of Background for the PROJECT's needs, the

Receiving Party commits itself not to use this Background except for the strict needs of the PROJECT.

**b. Results**

- i. Deliverables and Results of task 1 are the exclusive property of the PROGRAM Leader.
- ii. Deliverables and Results of Task 2 are the exclusive property of each of its creator respectively as mentioned in Appendix 1.
- iii. As and when the Results of the PROGRAM Leader are delivered by the PROGRAM Leader to IRSN, IRSN grants to NRC a personal and non-exclusive right to use these Results for its own internal research purpose and for non-commercial purpose and for an undetermined duration.
- iv. As and when the Results of IRSN are delivered by IRSN to NRC, IRSN grants to NRC a personal and non-exclusive right to use these Results for its own internal research purpose and for non-commercial purpose only and for an undetermined duration.
- v. As and when the Results of NRC are delivered by the NRC to IRSN, NRC grants to IRSN a personal and non-exclusive right to use these Results for its own internal research purpose and for non-commercial purpose only and for an undetermined duration with the right to sub-licence the exact same rights to the PROGRAM Leader.
- vi. For the purposes of this Agreement, the term "commercial purpose" shall comprise, inter alia (i) any disclosure, supply, assignment, transfer, sale, rental, distribution and/or making available of all or part of the Results to a third party, (ii) more generally, any use generating business profits or revenues.
- vii. NRC shall not acquire any title, copyright or other proprietary rights over the Results of the PROGRAM Leader or IRSN other than the access right specified here above. The Results shall remain the intellectual property of its respective creator and owner. The rights granted over the Results to NRC shall not be interpreted as a transfer of intellectual property rights, as defined by the French Intellectual Property Code.

**Article 6. FINANCIAL CONTRIBUTIONS**

- a. The total cost of the PROGRAM for the two tasks that are included in the PROJECT is about one million one hundred fifty thousand United States Dollars (USD \$ 1.150.000).
- b. All financial contributions set forth hereunder are fixed and firm amounts.
- c. The amounts are quoted in US Dollars (USD), which will be the account, invoice and payment currency.

- d. In consideration of the delivery of the Deliverables of task 1 and the rights granted over the Results and Deliverable of task 1 according to article 5, NRC shall contribute to the PROJECT to the extent of one hundred fifty thousand United States Dollars (USD \$150.000).

This amount excludes costs incurred by the Parties and the PROGRAM Leader for the definition of test; follow up of its preparation and interpretation (task 1) and the realization of calculations for the benchmark exercises (task 2). Each Party and the PROGRAM Leader will take in charge its part of the PROJECT at their own costs as mentioned in *Appendix 1*.

- e. The amounts shall be paid by NRC to IRSN on receipt of the corresponding invoices, and according to the following terms:

Deliverable N°	Year	Date	Deliverable transmitted by EDF within the project	Associated cost due by NRC in US Dollars
Milestone	2012	T0 : project kick-off, 1 <sup>st</sup> of January 2012		
1	2012	T0+3 months	CCI-7 pretest design report	
Milestone	2012	T0+6 months test conduction		
2	2012	T0 + 7 month	Benchmark exercise specification report	75 000 USD \$
Milestone	2012	T0 + 10 months results form simulation transmitted to ANL	Calculation reports	
3a			EDF calculation report	
4	2012	T0 + 10 months	CCI-7 test report	
5	2012	T0 + 12 months	Final report including synthesis of benchmark exercise	75 000 USD \$
Milestone	2012	T0 + 12 months end of the project after final report approval		

- f. Invoices shall be addressed to:

*Richard Lee  
Branch Chief, Fuel and Source Term Code Development Branch,  
Office of Nuclear Regulatory Research  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001*

- g. All payments due by NRC under this Agreement shall be made to the following bank account of IRSN in a 45 days delay from receipt of invoices

Bank Address: *Agent comptable de l'IRSN* (IRSN Accounting Dept.)  
at the *TRESOR PUBLIC – RECETTE GENERALE DES FINANCES*  
*Code Banque (bank code) 10071 – Code Guichet (sort code) 75000*  
*Compte (account) no. 00001000548 – RIB code 85*  
*BIC code: BDFEFRPPXXX*



NRC shall be responsible for wire transfer fees charged by its bank, but any other fees charged by a correspondent bank or the receiving bank shall be the responsibility of IRSN.

When NRC's financial contribution is directly related to the transmission of the Deliverables mentioned above, the NRC is authorized to delay payment of the financial contribution for as long as the delay in transmission of the Deliverables. In case of test failure, the benchmark exercise and associated deliverables will be canceled. Nevertheless, the PARTIES recognize they share the risk and the payments associated to these deliverables remain due by NRC and shall be paid to IRSN at the project end.

#### **Article 7.      LIABILITY**

IRSN shall not in any case be held responsible for any failure of the PROGRAM Leader. IRSN is not acting as a representative or agent of the PROGRAM Leader or NRC. Thus, in case of any default of the PROGRAM Leader, IRSN shall not be held liable and NRC agrees to bring any action directly against the PROGRAM Leader for any loss or damage whatsoever suffered by NRC. Likewise, in case of any default of the NRC, IRSN shall not be held liable and the Program LEADER has agreed to bring any action directly against NRC for any loss or damage whatsoever due to NRC suffered by the PROGRAM Leader.

No Party shall be responsible to any other Party for any cost arising from bodily injury or death caused to its employees, employed directly or not, which may occur in the course of the performance of the Agreement. This provision shall not apply if the injury or death has been caused by the gross negligence or wilful misconduct of the other Party or its agents.

In respect of any information or materials supplied by a Party to another Party under the Agreement no warranty or representation of any kind is made, given or implied neither as to the sufficiency or fitness for purpose. This provision supersedes any contrary provision of this Agreement.

The recipient Party shall in all cases be entirely and solely liable for the use to which it puts such information and materials.

No Party shall be responsible to any other Party for punitive damages, indirect or consequential loss or similar damage such as, but not limited to, loss of profit, loss of goodwill, loss of revenue, loss of opportunity or loss of contracts.

A Party's aggregate direct liability towards the other Party shall be limited to once the amount of the total cost invoiced by IRSN.

The exclusions and limitations of liability stated above shall not apply in the case of damage caused by fraud, a wilful act or gross negligence.

**Article 8. CONFIDENTIALITY**

- a. For the need of the Agreement, Disclosing Party shall mean when information are the property of NRC, NRC and when the information are the property of the PROGRAM Leader or of IRSN, IRSN.
- b. Each Recipient admits with regard to the Deliverables and the Results received from the Disclosing Party under the present Agreement, to:
- (i) keep all Confidential Information as secret and use the same degree of care, but no less than a reasonable degree of care, as such the Recipient uses with respect to its own similar information to protect the Confidential Information and to prevent (a) any use of Confidential Information other than for the use authorized in article 5 here above, (b) communication of Confidential Information to any third party without the Disclosing Party(ies) prior written consent or (c) publication of Confidential Information. Notably the Recipient shall not issue or release any articles, advertising, publicity or the other matter relating to any Confidential Information.
  - (ii) not use in whole or in part the Confidential Information for any purpose other than the purpose specified in article 5 above ;
  - (iii) disclose Confidential Information only to those officers or employees or agents on a 'need to know' basis and to ensure that said officers, employees or agents are bound by this Agreement and undertake to abide by it;
  - (iv) neither copy, nor otherwise reproduce nor duplicate in whole or in part the Confidential Information where such copying, reproduction or duplication have not been specifically authorized in writing by the Disclosing Party.
- c. Except as aforementioned, Each Recipient shall have no restriction with regard to the use of the Results that
- have or become generally publicly available through no fault of the Recipient, or;
  - was approved for unrestricted release or unrestricted disclosure by the Disclosing Party, or
  - was already lawfully know by the Recipient or the PROGRAM Leader prior its receipt;
  - is lawfully disclosed to the Recipient or the PROGRAM Leader by a third Party who is in lawful possession thereof and under no obligation of confidence to the Disclosing Party;
  - is independently developed by employees of the Recipient of the PROGRAM Leader who did not have access to the Disclosing Party's data, and without any breach by the Recipient of PROGRAM Leader of its obligations under this Agreement, or

- is required to be produced by order of a court of competent jurisdiction and provided the Recipient or the PROGRAM Leader promptly notifies the Disclosing Party upon receipt of such an order so as to give the Disclosing Party the opportunity to defend, limit or protect such production or disclosure prior to release hereunder.
- d. The Recipient hereby undertakes the obligation of the clause b and c during the Agreement and for a period of ten (10) years after its termination.

#### Article 9. PUBLICATION

Each Party shall not release any results for publication before the end of the confidentiality stated in article 8.d.

NRC shall be authorized to publish or communicate part or all of the Results of the PROGRAM Leader subject to the prior written approval of the PROGRAM Leader directly.

NRC shall be authorized to publish or communicate part or all of the Results of IRSN subject to the prior written approval of IRSN.

IRSN shall be authorized to publish or communicate part or all of the Results of NRC subject to the prior written approval of NRC. Any publication by the PROGRAM Leader shall be asked directly to NRC.

All publications or any other dissemination relating to the Result shall include the following statement to indicate that said Result was generated in the framework of this Agreement and with the other Party collaboration and the PROGRAM Leader:

*"The research leading to these results has been conducted by the US National Regulatory Commission - NRC and the French "Institut de Radioprotection et de Sûreté Nucléaire - IRSN and Electricité de France - EDF "*

#### Article 10. DURATION

- a. This Agreement shall enter into force upon its signature by both Parties with an effective date the 1<sup>st</sup> October, 2011 and shall remain valid for duration of 15 months.

In case the contract between the PROGRAM Leader and ANL and the contract between the PROGRAM Leader and IRSN is not concluded in a six months delay following signature of the Agreement, each Party will be free to terminate the contract with a one month delay.

Any amount already paid to IRSN shall be integrally refunded and any deliverables and Results already transmitted shall be return to the Disclosing Party and the Recipient shall cease immediately any use of the Result or Deliverable.

- b. The delays of performance of the PROJECT as mentioned in appendix 1 are indicative only.

**Article 11. FORCE MAJEURE**

- a. No Party shall be liable to the other if it cannot perform its obligations under this Agreement for a cause of force majeure, i.e. any event which is beyond its control. In such a case, notice of the event shall be given by the failing Party to the other Party and the delays of performance will be extended by the number of days necessary to overcome the cause of the delay. The performance of this Agreement shall be resumed as soon as practicable after such event has come to an end. If the performance of whole or part of this Agreement is delayed by reason of force majeure for a period exceeding one (1) year, either Party may request termination of this Agreement or the affected part thereof.
- b. Termination of this Agreement in accordance with the above shall not affect any financial obligation already payable between the Parties as long as the corresponding Deliverable has been furnished by IRSN. In the event, however, that a Deliverable is not furnished, NRC shall not be obligated to pay the corresponding or future payments to IRSN, unless and until such Deliverable has been furnished by the PROGRAM leader.

**Article 12. TERMINATION**

If one of the Parties fails to meet any of its obligations under this Agreement, the other Party may terminate the Agreement, in full or in part, once it has so notified the other Party by registered letter with acknowledgement of receipt and on the expiry of a period of sixty (60) days with such communication having produced no effect.

**Article 13. MISCELLANEOUS**

- a. Any modification to or waiving of any of the terms and conditions of this Agreement shall become effective only if drawn up in writing and signed by the Parties as an amendment to this Agreement.
- b. This Agreement supersedes all prior agreements and understandings between the Parties relating to the subject matter herein, and is intended by the Parties to be the complete and exclusive statement of the terms and conditions of their agreement.
- c. If any of the provisions of this Agreement is found, by a competent authority, to be void or unenforceable, such provision shall be deemed to be deleted from this Agreement, while the other provisions of this Agreement shall remain in full force and effect.

The Parties shall negotiate in good faith in order to agree upon a mutually satisfactory provision to be substituted for the provision so found to be void or unenforceable.

- d. The headings used in this Agreement are for convenient reference only and shall not be used for interpreting the provisions of this Agreement.

**Article 14. DISPUTES RESOLUTION**

The Parties agree to seek an amicable solution to any differences or disputes that may arise out of or in connection with the Agreement, if necessary with the assistance of one or more independent experts. Upon mutual agreement of the Parties, a dispute shall be submitted to an arbitral tribunal for binding arbitration in accordance with the applicable rules of international law. Unless the Parties or their designees agree otherwise in writing, the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL) shall govern.

Intending to be legally bound, the Parties have executed this Agreement in two (2) original copies by their duly authorized representatives on the day and at the place written here below, each Party receiving one (1) original copy thereof.

For NRC

Date : *July 2, 2012*

Place : *Rockville, MD*

Signature : *Brian W. Sheron*

Brian W. SHERON  
Director,  
Office of Nuclear  
Regulatory Research,  
US NRC

For IRSN:

Date : *10/04/12*

Place : *Fantouasy aux herbes*

Signature :

*[Signature]*  
p. d. Michel BRIERE  
Directeur général adjoint

Jacques REPUSSARD  
General Director of IRSN

**CERTIFIED A TRUE COPY**  
BY *[Signature]*  
Office of the Secretary

## APPENDIX 1: TECHNICAL APPENDIX

### Description of the PROJECT

The PROJECT is divided into two overlapping tasks:

- Support to the conduct of CCI-7 test by ANL,
- Participation in a benchmark exercise between simulation tools on the basis of CCI-7 test.

In anticipation of project task 1, the test specifications have been defined jointly by EDF, IRSN, US-NRC and ANL. In answer to this request, ANL provided a PROGRAM proposal included in the appendix A, Proposal n° P-11065, "Experiments to Demonstrate Ex-Vessel Core Coolability under Early Cavity Flooding Conditions" of *Appendix 2*.

After the start of the PROJECT, the first stage will consist in finalizing the definition of the test and validating the CCI-7 pretest design report written by ANL (*deliverable n°1*). ANL will be able then to finish the preparation of the test in order to proceed to its running envisaged in March 2012. If difficulties appear in this last stage the partners will be solicited to validate possible requests for exemption.

After the run of CCI-7 test, ANL will be able to write the specifications report of the benchmark exercise by integrating the key test parameters but not providing the results themselves (*deliverable n°2*). This document will allow EDF, IRSN and NRC to realize within a maximum of 3 months blind calculations of the test with their own tools, respectively TOLBIAC, ASTEC-MEDICIS and MELCOR-CORCON-CORQUENCH. These specifications will also specify the list of required outputs results from simulation and the format in which they will have to be communicated to ANL.

After having collected the data from simulation work carried out by each partners (*deliverable 3a, 3b and 3c*), ANL will communicate the CCI-7 test results to them by providing the test report (*deliverable n°4*). After interpretation of the test results, the partners will have the possibility to send ANL if they wish new simulations by taking again the same specifications for the supply of their results.

ANL will submit in conclusion a final report including the benchmark synthesis report (*deliverable n°5*), and that at the latest 14 months after the date of starting of the program (EDF-ANL contract signed the 4<sup>th</sup> of October 2011).

The acceptance of the last deliverable will put an end to the PROJECT.

Conditions for implementation

In accordance with the proposal written by ANL (see Table 3-1 in Appendix A of Appendix 2),

- The total cost to conduct CCI-7 test is one million fifty thousand US dollars (1 050.000 USD \$)
- The total cost to support a benchmark exercise is one hundred thousand US dollars (100 000 USD \$).

IRSN and NRC take part in the funding at a level of three hundred thousand US dollars (300 000 USD \$) with the financing with equal share of the first two tasks of the PROGRAM engaged by EDF. The schedule of payment is defined in connection with the PROJECT agenda and the distribution by EDF of the deliverable produced by ANL (see table below).

Deliverable N°	Year	Date	Deliverable transmitted within the project	Associated cost due by IRSN and NRC in US Dollars
Milestone	2012	<i>T0 : project kick-off, 1<sup>st</sup> of January 2012</i>		
1	2012	T0+3 months	CCI-7 pretest design report (ANL)	
Milestone	2012	<i>T0+6 months test conduction</i>		
2	2012	T0 + 7 month	Benchmark exercise specification report (ANL)	75 000 USD \$ (NRC) 75 000 USD \$ (IRSN)
Milestone	2012	<i>T0 + 10 months results from simulation transmitted to ANL</i>	Calculation reports	
3a			EDF calculation report	
3b			IRSN calculation report	
3c			NRC calculation report	
4	2012	T0 + 10 months	CCI-7 test report(ANL)	
5	2012	T0 + 12 months	Final report including synthesis of benchmark exercise (ANL)	75 000 USD \$ (NRC) 75 000 USD \$ (IRSN)
Milestone	2012	<i>T0 + 12 months end of the project after final report approval</i>		

Personnel of ANL, in the buildings of ANL, will complete work relating to the preparation, the running, the analysis and the documentation of CCI-7 test.

Personnel of ANL, in the buildings of ANL, will complete work relating to the specification, the coordination, the analysis of the results of simulation and the documentation of the benchmark exercise.

Work concerning the definition of the test, the follow-up of its preparation, the realization of calculations for the benchmark exercise and the interpretation of the results will be completed by EDF, IRSN and NRC, in their respective buildings, with their respective simulation tools and on their own funding.

## **APPENDIX 2:**

**WORK FOR OTHERS AGREEMENT N°854Y4 BETWEEN UCHICAGO ARGONNE, LLC AS OPERATOR OF ARGONNE NATIONAL LABORATORY OPERATING UNDER PRIME CONTRACT NO. DE-AC02-06CHI1357 FOR THE U. S. DEPARTMENT OF ENERGY AND ELECTRICITE DE FRANCE (Proposal n° P-11065, “Experiments to Demonstrate Ex-Vessel Core Coolability under Early Cavity Flooding Conditions” in Appendix A)**